

What is claimed is:

1. A semiconductor temperature detecting circuit comprising:

a first and a second semiconductor temperature sensor;

means for supplying different constant currents to the first and the second semiconductor temperature sensors; and

means for detecting temperature based on a corresponding relationship between a ratio of output voltages of the first and the second semiconductor temperature sensors and the temperature.

2. The semiconductor temperature detecting circuit according to Claim 1:

wherein the first and the second semiconductor temperature sensors include respectively bipolar transistors connected in Darlington connection by numbers of stages different from each other on a same semiconductor substrate.

3. The semiconductor temperature detecting circuit according to Claim 1 or 2:

wherein the means for detecting the temperature comprises:

a voltage dividing circuit for dividing the output voltage of the first semiconductor temperature sensor

by a predetermined ratio;

a comparator for inputting the output voltage of the first semiconductor temperature sensor divided by the voltage dividing circuit as a first input and inputting the output voltage of the second semiconductor temperature sensor as a second input; and

a processing circuit for detecting the temperature based on an output of the comparator and the corresponding relationship.

4. The semiconductor temperature detecting circuit according to Claim 3:

wherein the voltage dividing circuit outputs divided voltages by a plurality of the predetermined ratios and the comparator successively provides the plurality of divided voltages to the first input and successively compares the first input with the second input.

5. The semiconductor temperature detecting circuit according to Claim 3:

wherein the dividing circuit outputs divided voltages by a plurality of the predetermined ratios and there are present the comparators by a number the same as that of the plurality for providing the plurality of divided voltages to the first inputs of the respective comparators and simultaneously comparing the first inputs

with the second input.

6. The semiconductor temperature detecting circuit according to Claim 3:

wherein the processing circuit outputs the detected temperature as a digital signal.

7. The semiconductor temperature detecting circuit according to any one of Claims 2 through 6:

wherein the semiconductor substrate is of a conductive type of a P type or an N type.

8. A method of detecting temperature by a semiconductor device comprising the steps of:

providing a first and a second semiconductor temperature sensor;

supplying different constant currents to the first and the second semiconductor temperature sensors;

calculating a corresponding relationship between a ratio of output voltages of the first and the second semiconductor temperature sensors and temperature; and

detecting the temperature based on the corresponding relationship.

9. The method of detecting temperature by a semiconductor according to Claim 8:

wherein the step of providing the first and the second semiconductor temperature sensors includes a step of providing the first and the second semiconductor sensors

respectively having bipolar transistors connected in Darlington connection by numbers of stages different from each other on a same semiconductor substrate.

10. The method of detecting temperature by a semiconductor device according to Claim 9:

wherein the step of detecting the temperature further comprising the steps of:

dividing the output voltage of the first semiconductor temperature sensor by a predetermined ratio;

comparing the divided output voltage of the first semiconductor temperature sensor as a first input and the output voltage of the second semiconductor temperature sensor as a second input; and

detecting the temperature based on a result of the comparison and the corresponding relationship.

11. The method of detecting temperature by a semiconductor device according to Claim 10:

wherein the step of dividing the output voltage of the first semiconductor temperature sensor by the predetermined ratio further comprising the steps of:

dividing the output voltage of the first semiconductor temperature sensor by a plurality of the predetermined ratios; and

successively constituting the first input by the

plurality of divided voltages and successively comparing the first input with the second input.

12. The method of detecting temperature by a semiconductor device according to Claim 10:

wherein the step of dividing the output voltage of the first semiconductor temperature sensor by the predetermined ratio further comprising the steps of:

dividing the output voltage of the first semiconductor temperature sensor by a plurality of the predetermined ratios; and
simultaneously constituting the first input by the plurality of divided voltages and simultaneously comparing the first input with the second input.